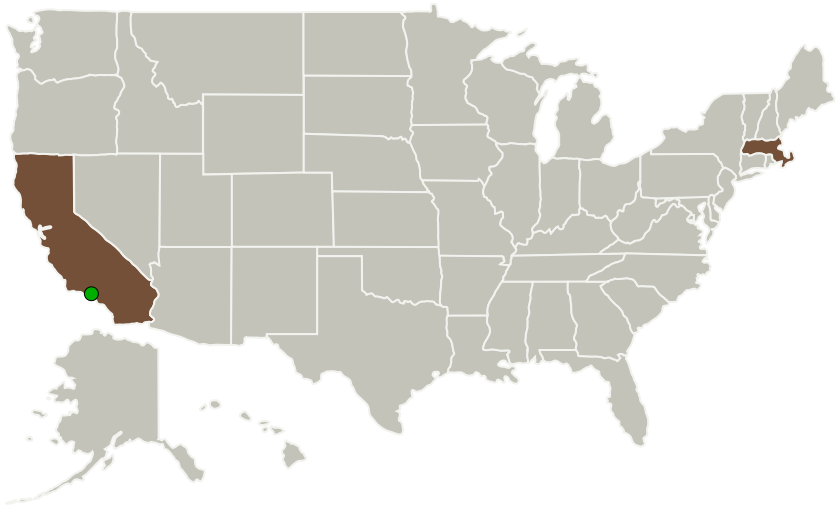
Vapor Hydrogen Peroxide Sterilization System for Contamination Control, Phase I

Completed Technology Project (2016 - 2016)

Project Introduction

NASA mission planners continue to develop plans for investigating celestial bodies including Europa, Enceladus, and Mars for potential life detection. Contamination Control and Planetary Protection requirements focus on both forward and backward contamination from such bodies where a number of acceptable processes have been developed for sterilizing spacecraft hardware and sample return materials. In particular for backward contamination control, NASA has shown that vaporized hydrogen peroxide is an effective method for sterilizing samples and surfaces. However, for long duration exploration missions, stored hydrogen peroxide solutions lose their efficacy. To ensure an effective vaporized hydrogen peroxide sterilization process for return trips, Reactive Innovations, LLC proposes to develop a miniaturized vapor hydrogen peroxide generator that produces this sterilant in situ using only water and DC electrical energy. With this approach, surfaces and sample return materials can be effectively sterilized during sample collection using a NASA approved sterilant.

Primary U.S. Work Locations and Key Partners



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Organizations Performing Work	Role	Type	Location
Reactive Innovations, LLC	Lead Organization	Industry	Westford, Massachusetts
Jet Propulsion Laboratory(JPL)	Supporting Organization	NASA Center	Pasadena, California

Primary U.S. Work Locations	
California	Massachusetts

Project Transitions

June 2016: Project Start

December 2016: Closed out

Closeout Documentation:

- Final Summary Chart*(https://techport.nasa.gov/file/140331)*

Images

Briefing Chart Image
Vapor Hydrogen Peroxide Sterilization System for Contamination Control, Phase I
(https://techport.nasa.gov/image/132535)

Final Summary Chart Image
Vapor Hydrogen Peroxide Sterilization System for Contamination Control, Phase I Project Image
(https://techport.nasa.gov/image/132130)

Organizational Responsibility

Responsible Mission Directorate:
Space Technology Mission Directorate (STMD)

Lead Organization:
Reactive Innovations, LLC

Responsible Program:
Small Business Innovation Research/Small Business Tech Transfer

Project Management

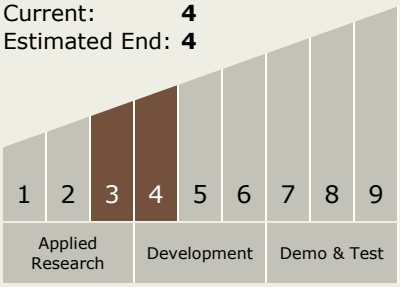
Program Director:
Jason L Kessler

Program Manager:
Carlos Torrez

Principal Investigator:
Daniel Carr

Technology Maturity (TRL)

Start: **3**
Current: **4**
Estimated End: **4**



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Technology Areas

Primary:

- TX07 Exploration Destination Systems
  - TX07.3 Mission Operations and Safety
    - TX07.3.5 Planetary Protection

Target Destinations

The Moon, Mars, Outside the Solar System, The Sun, Earth, Others Inside the Solar System